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LAKE KOSHKONONG, JEFFERSON COUNTY, WISCONSIN

Pacific Northwest Environmental Research Laboratory

Prepared for:

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivded according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Wisconsin Department of Natural Resources for professional involvement and to the Wisconsin National Guard for conduct of the tributary sampling phase of the Survey.

Francis H. Schraufnagel, Acting Assistant Director, and Joseph R. Ball of the Bureau of Water Quality, and Donald R. Winter, Lake Rehabilitation Program, provided invaluable lake documentation and counsel during the Survey. Central Office and District Office personnel of the Department of Natural Resources reviewed the preliminary reports and provided critiques most useful in the preparation of this Working Paper series.

Major General James J. Lison, Jr., the Adjutant General of Wisconsin, and Project Officer CW-4 Donald D. Erickson, who directed the volunteer efforts of the Wisconsin National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

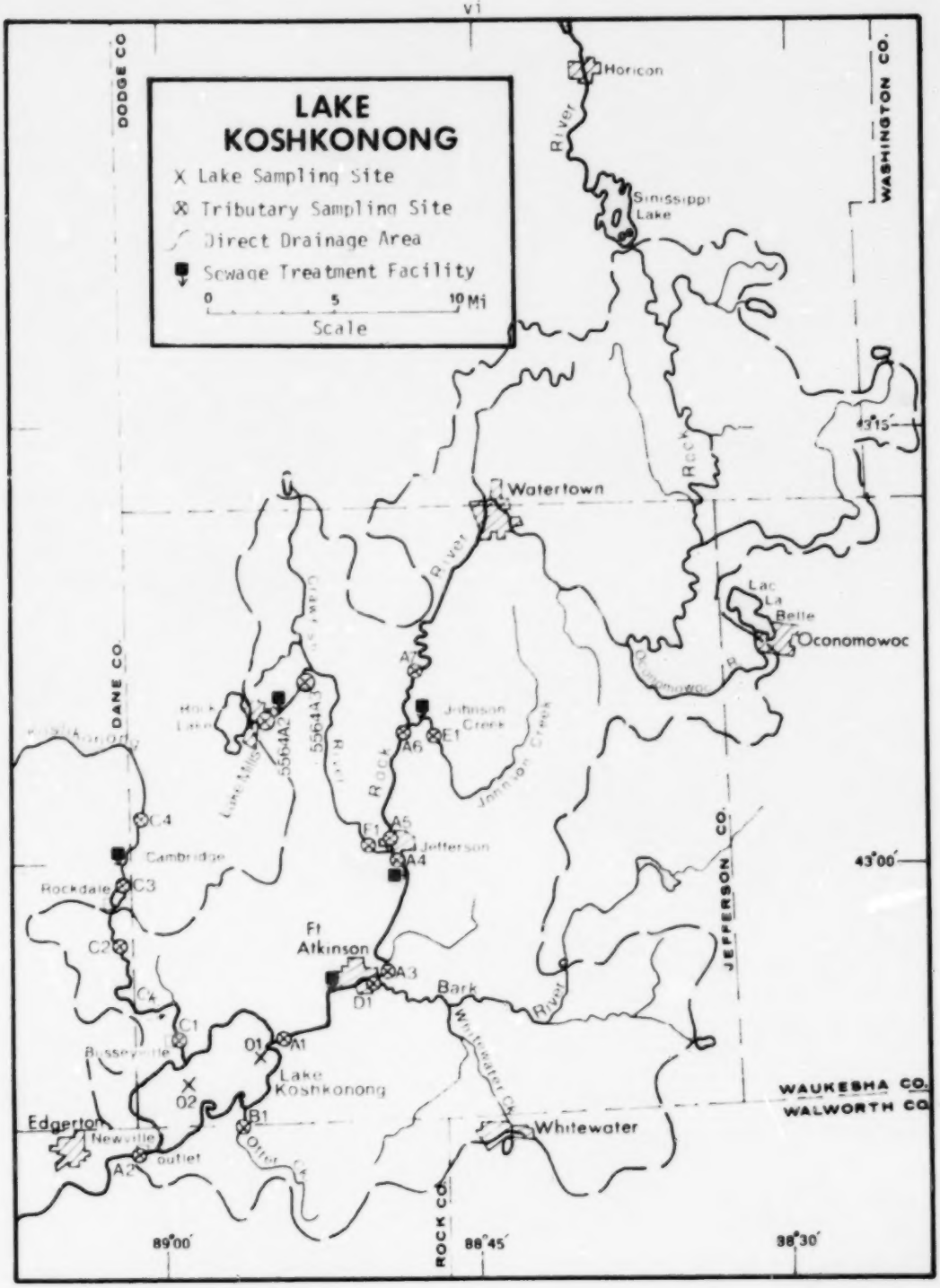
NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF WISCONSIN

LAKE NAME	COUNTY
Altoona	Eau Claire
Beaver Dam	Barron
Beaver Dam	Dodge
Big Eau Pleine	Marathon
Browns	Racine
Butte des Morts	Winnebago
Butternut	Price, Ashland
Castle Rock Flowage	Juneau
Como	Walworth
Crystal	Vilas
Delavan	Walworth
Eau Claire	Eau Claire
Geneva	Walworth
Grand	Green Lake
Green	Green Lake
Kegonsa	Dane
Koshkonong	Jefferson, Rock, Dane
Lac La Belle	Waukesha
Middle	Walworth
Nagwicka	Waukesha
Oconomowoc	Waukesha
Okauchee	Waukesha
Petenwell Flowage	Juneau
Pewaukee	Waukesha
Pigeon	Waupaca
Pine	Waukesha
Poygan	Winnebago, Waushara
Rock	Jefferson
Rome Pond	Jefferson, Waukesha
Round	Waupaca
Shawano	Shawano

LAKE NAME	COUNTY
Sinnissippi	Dodge
Swan	Columbia
Tainter	Dunn
Tichigan	Racine
Townline	Oneida
Trout	Vilas
Wapogassett	Polk
Wausau	Marathon
Willow	Oneida
Winnebago	Winnebago, Fond Du Lac, Calumet
Wisconsin	Columbia
Wissota	Chippewa
Yellow	Burnett


LAKE KOSHKONONG
X Lake Sampling Site
X Tributary Sampling Site
Direct Drainage Area
Sewage Treatment Facility
0 5 10 Mi
Scale
DODGE CO
DANE CO
ROCK CO
JEFFERSON CO
WASHINGTON CO.
WAUKESHA CO.
WALWORTH CO.
Horicon
Simssippi Lake
Watertown
Lac La Belle
Oconomowoc
Cambridge
Rockdale
Ft Atkinson
Jefferson
Johnson Creek
Bark River
Whitewater Creek
Whitewater
Lake Koshkonong
Edgerton
Newville
Outlet
43°15'
43°00'
89°00'
88°45'
88°30'

LAKE KOSHKONONG

STORET NO. 5522

I. CONCLUSIONS

A. Trophic Condition:

Survey data and the records of others show Lake Koshkonong is eutrophic. Because of the morphometry, it is likely this lake would be considered eutrophic without cultural influences.

B. Rate-Limiting Nutrient:

Algal assay results and the lake data show Lake Koshkonong was nitrogen limited at the time the assay sample was collected. Lake data indicate nitrogen limitation during the other sampling times as well.

C. Nutrient Controllability:

1. Point sources--During the sampling year, Lake Koshkonong received a total phosphorus load at a rate more than ten times that proposed by Vollenweider (in press) as "dangerous"; i.e., a eutrophic rate (see page 16). However, the combined phosphorus loads from all of the point sources considered in the Survey amount to only about 16% of the total load to the lake. Even if complete removal of phosphorus were instituted at these sources, the phosphorus loading to the lake would still be eight times the "dangerous" rate. Therefore, it is concluded that control of phosphorus at the indicated point sources would not appreciably change the trophic condition of Lake Koshkonong.

2. Non-point sources--It is noted that the per-square-mile phosphorus contributions of the Rock River and Koshkonong Creek are very high as compared to that of Otter Creek, which is not impacted by any known point sources, and thus probably is representative of areal or non-point source contributions (see page 16). It seems appropriate to give further consideration to the sources contributing to the high export rates of the Rock River and Koshkonong Creek.

On the basis of the information in the Department of Natural Resources Rock River drainage reports, it is estimated that the sewered population of the Koshkonong Creek subdrainage is 12,000 people. At 2.5 lbs/P/yr per capita, municipal sources would account for 30,000 of the 42,420 lbs P measured in the creek at station C-1 during the sampling year. The remaining load of 12,420 lbs amounts to 74 lbs/mi^2/yr, and thus it appears that the point-source phosphorus contribution in the Koshkonong Creek subdrainage are almost all municipal (the only food-industry point sources in the subdrainage are one cannery and one cheese plant).

In the Rock River subdrainage, it is estimated that the sewered population tributary to the river upstream from station A-1 is 108,000 persons. At 2.5 lbs P/capita/yr, municipal sources would account for 270,000 of the 869,150 lbs P measured in the river at station A-1 during the sampling year. The remaining load of 59,650 lbs amounts to a very high 274 lbs P/mi^2/yr or about 200 lbs P/mi^2 more than that assumed to be attributable

to areal sources. Thus it appears that point sources other than municipal, possibly food-industry sources, are the more important contributors to the Rock River subdrainage phosphorus export.

It is recognized that areal contributions will vary from drainage to drainage and even within a drainage, depending on soil types, slopes, crop types, etc, but it does not seem likely that areal contributions in the Rock River drainage would be nearly four times that attributable to the Otter Creek and Koshkonong Creek drainages. However, to assess the possibility that such a high areal contribution might occur, the following table was prepared.

AGRICULTURE IN THE ROCK RIVER DRAINAGE*
(Walters, et al.; 1973)

Commodity	Rank Among 70 Wisconsin Counties		
	Dane	Dodge	Jefferson
Corn for grain	1	4	9
Corn for silage	1	2	21
Oats	12	4	26
Barley	43	5	42
Wheat	13	16	24
Soy beans	10	32	6
Alfalfa	2	4	30
Tobacco	2	12	9
Peas	4	3	23
Sweet corn	4	2	9
All cattle	2	4	27
Milk cows	2	3	26
Swine	2	5	1
Stock sheep	3	8	26
Chickens	2	5	1
Eggs	2	4	1
"Mean rank"	6.6	7.2	17.6

* 1972 crops; 1973 livestock.

It can be seen that Dane and Dodge counties are about equal in overall agricultural activity and that both markedly exceed the activity in Jefferson County. Further, in 1969 usage of commercial fertilizers (Anonymous, 1971), Dane County ranked first with 192,960 acres fertilized, and Dodge County ranked second with 163,120. Jefferson was well down the list with only 81,540 acres fertilized.

The above information, while not conclusive, does suggest that the areal contributions to the Rock River drainage of Dodge and Jefferson counties should not differ too much from the areal contributions to the Koshkonong Creek drainage of Dane County.

II. INTRODUCTION

Reportedly, Lake Koshkonong, 6th largest lake in Wisconsin, was once a marsh and was widely famed for excellent waterfowl hunting (Poff, et al., 1968). However, the original Indian Ford Dam was rebuilt in 1917 with a higher head, and the marsh character of the lake was changed. Now, because of lack of depth and long wind fetch, the lake is usually very turbid during open-water periods, and shoreline erosion is said to be a continuing problem.

Although the lake is aesthetically less pleasing than most Wisconsin waters, recreational uses include boating, water-skiing, and fishing. The lake is regarded as one of the better fishing lakes in Jefferson County, and good catches of northern pike, walleyes, white bass, crappies, channel catfish, and bullheads are said to be common. Carp are abundant (Narf, 1974).

Public access is provided at a number of sites, and commercial facilities are available.

III. LAKE AND DRAINAGE BASIN CHARACTERISTICS

A. Lake Morphometry*:

1. Surface area: 10,480 acres.
2. Mean depth: 5.3 feet.
3. Maximum depth: 7 feet.
4. Volume: 55,793 acre/feet.
5. Mean hydraulic retention time: 24 days.

B. Tributary and Outlet:
(See Appendix A for flow data)

1. Tributaries -

Name	Drainage area†	Mean flow†
Rock River	2,190.0 mi^2	1,070.8 cfs
Otter Creek	44.0 mi^2	16.8 cfs
Koshkonong Creek	168.0 mi^2	68.1 cfs
Minor tributaries & immediate drainage -	81.6 mi^2	38.6 cfs
Totals	2,483.6 mi^2	1,194.3 cfs

2. Outlet -

Rock River	2,500.0 mi^{2}††	1,194.3 cfs

C. Precipitation†††:

1. Year of sampling: 37.7 inches.
2. Mean annual: 30.2 inches.

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* Ball, 1974.

† Drainage areas are accurate within ±0.5%; mean daily flows are accurate within ±40%; mean monthly flows are accurate within ±35%; and normalized monthly flows are accurate within ±35%.

†† Includes area of lake.

††† See Working Paper No. 1, "Survey Methods".

IV. LAKE WATER QUALITY SUMMARY

Lake Koshkonong was sampled three times during the open-water season of 1972 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from two stations on the lake and from one or more depths at each station (see map, page vi). During each visit, a single depth-integrated (near bottom to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the last visit, a single five-gallon depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 4 feet at station 1 and 4 feet at station 2.

The results obtained are presented in full in Appendix B, and the data for the fall sampling period, when the lake was essentially well-mixed, are summarized below. Note, however, the Secchi disc summary is based on all values.

For differences in the various parameters at the other sampling times, refer to Appendix B.

A. Physical and chemical characteristics:

Parameter	Minimum	Mean	Median	Maximum
		FALL VALUES (11/10/72)		
Temperature (Cent.)	7.5	7.5	7.5	7.5
Dissolved oxygen (mg/l)	9.3	9.9	9.9	10.6
Conductivity (μmhos)	640	645	645	650
pH (units)	7.8	7.9	7.9	8.0
Alkalinity (mg/l)	244	247	247	250
Total P (mg/l)	0.186	0.188	0.188	0.191
Dissolved P (mg/l)	0.157	0.157	0.157	0.157
NO_2 + NO_3 (mg/l)	1.060	1.080	1.080	1.100
Ammonia (mg/l)	0.100	0.105	0.105	0.110
		ALL VALUES		
Secchi disc (inches)	10	19	14	33

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Number per ml
06/22/72	1. Cyclotella	8,018
	2. Melosira	4,234
	3. Scenedesmus	2,793
	4. Synedra	1,892
	5. Merismopedia	1,441
	Other genera	7,928
	Total	26,306
08/17/72	1. Melosira	35,818
	2. Cyclotella	9,273
	3. Scenedesmus	3,454
	4. Anabaena	2,545
	5. Navicula	2,182
	Other genera	4,364
	Total	57,636
11/10/72	1. Stichococcus	2,151
	2. Flagellates	1,736
	3. Anabaena	566
	4. Melosira	528
	5. Cyclotella	453
	Other genera	3,056
	Total	8,490

2. Chlorophyll a -
(Because of instrumentation problems during the 1972 sampling, the following values may be in error by plus or minus 20 percent.)

Sampling Date	Station Number	Chlorophyll a (µg/l)
06/22/62	01	64.9
	02	78.9
08/17/72	01	24.9
	02	21.5
11/10/72	01	9.3
	02	17.6

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.100	1.220	29.7
0.006 P	0.106	1.220	30.4
0.012 P	0.112	1.220	30.2
0.024 P	0.124	1.220	31.0
0.060 P	0.160	1.220	30.8
0.060 P + 10.0 N	0.160	11.220	65.1
10.0 N	0.100	11.220	51.6

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates that the potential primary productivity of Lake Koshkonong was very high at the time the sample was taken.

The assay results also indicate the lake was nitrogen limited when sampled. Note the lack of significant changes in yield with increased levels of orthophosphorus until

nitrogen was also added. Note also the marked increase in yield when only nitrogen was added.

The lake data indicate the lake was nitrogen limited at the other sampling times as well (N/P ratios were 3/1 or less, and nitrogen limitation would be expected).

D. Trophic Condition:

Survey data and the records of others show that Lake Koshkonong is very eutrophic; and algal blooms and dense beds of aquatic vegetation are said to be common (Poff, et al., 1968).

Of the 46 Wisconsin lakes studied, 41 had less mean total phosphorus, 41 had less mean inorganic nitrogen, 37 had less mean chlorophyll a, and none had a higher algal assay control yield.

The morphometry of Lake Koshkonong suggests that this lake would be considered eutrophic even if cultural influences were absent.

V. NUTRIENT LOADINGS
(See Appendix C for data)

For the determination of nutrient loadings, the Wisconsin National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page vi), except for the high runoff months of April and May when two samples were collected at most of the sites. Sampling was begun in September, 1972, and was completed in August, 1973.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Wisconsin District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings. Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S) were estimated by using the nutrient loads of Otter Creek, in lbs/mi^2/year, and multiplying by the ZZ area in mi^2.

The operators of the Fort Atkinson, Jefferson, and Cambridge wastewater treatment plants provided monthly effluent samples and corresponding flow data. The communities of Lake Mills and Johnson Creek declined participation in the Survey, and nutrient loads from those sources were estimated at 2.5 lbs P and 7.5 lbs N/capita/year.

The City of Whitewater was initially omitted from the Survey through an oversight. However, the City is about 18 stream miles from the lake and within the limits of the Survey. On the other hand, the City of Watertown lies just outside the 25-mile limit of the Survey (ca. 28 stream miles) but is now included because size of the community and possible impact on Lake Koshkonong. Nutrient loads for both cities were estimated at 2.5 lbs P and 7.5 lbs N/capita/year.

In the following loading tables, the loads attributed to the tributaries do not include municipal loads.

A. Waste Sources:

1. Known municipal -

Name	Pop. Served*	Treatment	Mean Flow (mgd)	Receiving Water
Cambridge	689	Stab. pond	0.108	Koshkonong Creek
Fort Atkinson	9,164	Act. sludge	1.850	Rock River
Jefferson	5,429	Trickling filter	1.358	Rock River
Lake Mills	3,556	Trickling filter	0.356**	Crawfish River
Johnson Creek	790	Trickling filter	0.079**	Johnson Creek
Watertown	15,683	Trickling filter	1.568**	Rock River
Whitewater	12,038	Trickling filter & act. sludge	1.204**	Whitewater Creek

* 1970 Census.
** Estimated at 100 gal/capita/day.

2. Known industiral* - Several food-processing plants are located within the Lake Koshkonong drainage basin. However, because of the constraints of the Survey**, these sources were not evaluated directly (see discussion, page 2).

* McKersie, et al., 1968; 1971.
** See Working Paper No. 1.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	lbs P/ yr	% of total
a. Tributaries (non-point load) -		
Rock River	723,190	78.4
Otter Creek	3,270	0.4
Koshkonong Creek	40,770	4.4
b. Minor tributaries & immediate drainage (non-point load) -	6,040	0.7
c. Known municipal -		
Fort Atkinson	36,210	3.9
Jefferson	29,570	3.2
Watertown	39,210	4.2
Whitewater	30,100	3.3
Cambridge	1,650	0.2
Lake Mills	8,890	0.9
Johnson Creek	1,980	0.2
d. Septic tanks* -	250	<0.1
e. Industrial -	?	-
f. Direct precipitation** -	1,630	0.2
Total	922,760	100.0

2. Outputs -

Lake outlet - Rock River 728,790

3. Net annual P accumulation - 193,970 pounds

* Estimated 400 unsewered dwellings on lakeshore; see Working Paper No. 1.
** See Working Paper No. 1.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	lbs N/ yr	% of total
a. Tributaries (non-point load) -		
Rock River	5,404,240	80.0
Otter Creek	78,650	1.2
Koshkonong Creek	629,490	9.3
b. Minor tributaries & immediate drainage (non-point load) -	145,900	2.2
c. Known municipal -		
Fort Atkinson	108,330	1.6
Jefferson	38,100	0.6
Watertown	117,620	1.7
Whitewater	90,280	1.3
Cambridge	2,420	<0.1
Lake Mills	26,670	0.4
Johnson Creek	5,920	<0.1
d. Septic tanks* -	9,500	0.1
e. Industrial -	?	-
f. Direct precipitation** -	100,960	1.5
Total	6,758,080	100.0

2. Outputs -

Lake outlet - Rock River 6,167,370

3. Net annual N accumulation - 590,710 pounds

* Estimated 400 unsewered dwellings on lakeshore; see Working Paper No. 1.
** See Working Paper No. 1.

D. Mean Annual Non-point Nutrient Export by Subdrainage Area:

Tributary	lbs P/mi^2/yr	lbs N/mi^2/yr
Rock River	330	2,468
Otter Creek	74	1,788
Koshkonong Creek	243	3,747

E. Yearly Loading Rates:

In the following table, the existing phosphorus loading rates are compared to those proposed by Vollenweider (in press). Essentially, his "dangerous" rate is the rate at which the receiving waters would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous" and "permissible".

	Total Phosphorus		Total Nitrogen	
Units	Total	Accumulated	Total	Accumulated
lbs/acre/yr	88.1	18.5	644.9	56.4
grams/m^2/yr	9.87	2.07	72.3	6.3

Vollenweider loading rates for phosphorus (g/m^2/yr) based on mean depth and mean hydraulic retention time of Lake Koshkonong:

"Dangerous" (eutrophic rate)	0.96
"Permissible" (oligotrophic rate)	0.48

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VII. APPENDICES

APPENDIX A

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR WISCONSIN 9/30/74

LAKE CODE 5522 LAKE KOSHKONONG

TOTAL DRAINAGE AREA OF LAKE 2500.00

TRIBUTARY	SUB-DRAINAGE AREA	NORMALIZED FLOWS JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
5522A1	2130.00	770.00	890.00	2100.00	2600.00	1400.00	920.00	690.00	590.00	590.00	670.00	770.00	670.00	1070.77
5522A2	2500.00	874.60	961.20	2499.00	2854.60	1537.90	1057.30	788.20	672.00	672.80	768.90	874.70	768.90	1194.29
5522B1	44.00	6.50	8.20	65.00	60.00	20.00	9.40	6.30	4.60	4.50	4.90	6.50	4.90	16.80
5522C1	168.00	31.00	41.00	220.00	220.00	90.00	46.00	32.00	24.00	24.00	26.00	33.00	27.00	68.08
5522ZZ	94.00	17.00	22.00	140.00	130.00	46.00	24.00	17.00	12.00	12.00	11.00	17.00	13.00	38.64

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 2500.00
SUM OF SUB-DRAINAGE AREAS = 2500.00

TOTAL FLOW IN = 14330.19
TOTAL FLOW OUT = 14330.88

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
5522A1	9	72	2130.00	24	3130.00				
	10	72	2900.00	20	2400.00				
	11	72	2500.00	30	1100.00				
	12	72	960.00	27	650.00				
	1	73	2200.00	29	2500.00				
	2	73	2600.00	26	1500.00				
	3	73	5000.00	23	5800.00				
	4	73	4800.00	13	3700.00	29	6000.00		
	5	73	5900.00	15	6300.00	28	5000.00		
	6	73	3200.00	29	1300.00				
	7	73	700.00	30	500.00				
	8	73	530.00	25	600.00				
5522A2	9	72	2300.00	24	3400.00				
	10	72	3300.00	20	2700.00				
	11	72	2900.00	30	2000.00				
	12	72	1100.00	27	760.00				
	1	73	2400.00	29	2800.00				
	2	73	2900.00	26	1800.00				
	3	73	5600.00	23	6400.00				
	4	73	5500.00	13	4200.00	29	6900.00		
	5	73	6800.00	15	7200.00	28	5800.00		
	6	73	3700.00	29	1500.00				
	7	73	830.00	30	600.00				
	8	73	630.00	25	720.00				

TRIBUTARY FLOW INFORMATION FOR WISCONSIN 9/30/74

LAKE CODE 5522 LAKE KOSHKONONG

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
552281	9	72	110.00	24	310.00				
	10	72	90.00	20	50.00				
	11	72	56.00	30	8.80				
	12	72	13.00	27	4.80				
	1	73	130.00	29	150.00				
	2	73	130.00	26	14.00				
	3	73	240.00	23	260.00				
	4	73	110.00	13	86.00	29	140.00		
	5	73	140.00	15	150.00	28	120.00		
	6	73	32.00	29	13.00				
	7	73	6.60	30	4.60				
	8	73	4.00	25	4.50				
5522C1	9	72	300.00	24	680.00				
	10	72	300.00	20	190.00				
	11	72	210.00	30	65.00				
	12	72	56.00	27	25.00				
	1	73	340.00	29	400.00				
	2	73	370.00	26	71.00				
	3	73	680.00	23	760.00				
	4	73	400.00	13	310.00	29	510.00		
	5	73	600.00	15	530.00	28	420.00		
	6	73	160.00	29	62.00				
	7	73	33.00	30	24.00				
	8	73	21.00	25	25.00				
5522ZZ	9	72	200.00	24	490.00				
	10	72	180.00	20	110.00				
	11	72	120.00	30	29.00				
	12	72	31.00	27	13.00				
	1	73	230.00	29	270.00				
	2	73	250.00	26	37.00				
	3	73	460.00	23	450.00				
	4	73	240.00	13	190.00	29	300.00		
	5	73	300.00	15	320.00	28	250.00		
	6	73	83.00	29	33.00				
	7	73	17.00	30	12.00				
	8	73	11.00	25	12.00				

APPENDIX B

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 74/09/30

552201
42 53 18.0 088 55 06.0
KOSHKONONG LAKE
55 WISCONSIN

11EPALES 2111202
3 0002 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/22	13 05	0000	21.3	9.3	14	550	8.40	265	0.160	0.110	0.427	0.248
72/08/17	18 45	0000			13	580	7.80	242	1.240	0.180	0.333	0.209
	18 45	0004	26.2	6.1		595	7.80	244	1.260	0.180	0.390	0.222
72/11/10	15 00	0000	7.5	9.3	33	650	7.80	250	1.060	0.100	0.186	0.157

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/22	13 05	0000	64.9J
72/08/17	18 45	0000	24.4J
72/11/10	15 00	0000	9.3J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/09/30

552202
42 52 12.0 088 58 18.0
KOSHKONONG LAKE
55 WISCONSIN

11EPALES
3

2111202
0003 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/22	13 25	0000	19.5	7.9	14	590	8.60	295	0.060	0.080	0.298	0.148
72/08/17	18 20	0000			10	520	8.55	226	0.220	0.100	0.418	0.254
	18 20	0004	25.9	11.1		515	8.58	226	0.150	0.070	0.422	0.360
72/11/10	15 10	0000	7.5	10.6	29	640	8.00	244	1.100	0.110	0.191	0.157

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/22	13 25	0000	78.9J
72/08/17	18 20	0000	21.5J
72/11/10	15 10	0000	17.6J

J VALUE KNOWN TO BE IN ERROR

APPENDIX C

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 74/10/02

552281 L5552281
42 54 00.0 088 54 00.0
ROCK RIVER
55 IS FT ATKINSON
1/LAKE KOSHKONONG
FROM BLACKHAWK ISL RD SW OFFT ATKINSON
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	11 50		0.290	2.600	0.172	0.300	0.520
72/10/20	12 30		0.470	1.350	0.100	0.220	0.305
72/11/30	10 35		1.620	1.600	0.160	0.210	0.273
72/12/27	11 40		1.470	1.470	0.390	0.280	0.360
73/01/29	12 20		1.800	1.890	0.370	0.231	0.300
73/02/25	10 25		1.700	2.600	0.320	0.230	0.330
73/04/13	10 30		0.520	0.690	0.015	0.017	0.017
73/05/28	10 30		0.580	1.815	0.126	0.220	0.320
73/06/29	11 08		0.037	1.470	0.022	0.190	0.420
73/07/30	15 00		0.120	2.400	0.010	0.280	0.460
73/08/25	10 30		0.540	2.520	0.176	0.350	0.630

STORET RETRIEVAL DATE 74/10/02

S522A2 L5522A2
42 50 00.0 089 01 30.0
ROCK RIVER
55 15 STOUGHTON
O/LAKE KOSHKONONG
ST HWY 50 BRDG AT NEWVILLE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	10 15		0.667	1.900	0.204	0.210	0.300
72/10/20	11 15		0.380	2.050	0.110	0.170	0.260
72/11/30	10 00		1.060	1.540	0.044	0.132	0.175
72/12/27	11 10		1.580	1.500	0.180	0.180	0.240
73/01/29	10 35		1.920	1.700	0.280	0.180	0.270
73/02/26	09 40		1.400	1.600	0.084	0.120	0.200
73/03/23	09 40		1.360	1.800	0.040	0.078	0.215
73/04/13	09 45		0.210	1.800	0.012	0.025	0.170
73/04/29	14 15		0.350	2.310	0.040	0.027	0.150
73/05/15	13 40		0.430	1.400	0.019	0.110	0.210
73/05/28	09 30		0.240	1.890	0.054	0.105	0.270
73/06/29	10 37		0.010K	2.400	0.017	0.250	0.515
73/07/30	14 05		0.017	1.980	0.037	0.230	0.430
73/08/25	09 30		0.060	1.500	0.189	0.360	0.575

K: VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 74/10/02

5522A3 LS552243
42 56 00.0 088 49 00.0
ROCK RIVER
55 15 FT ATKINSON
1/LAKE KOSHKONONG
ST HWY 106 BRDG ABOV FT ATKINSON STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	11 05		0.155	1.950	0.190	0.273	0.390
72/10/20	13 00		0.430	1.650	0.090	0.220	0.300
72/11/30	10 55		1.400	1.600	0.110	0.200	0.273
72/12/27	12 15		1.900	1.680	0.300	0.240	0.350
73/01/29	12 10		1.660	1.890	0.360	0.230	0.300
73/02/26	10 40		1.500	1.690	0.200	0.190	0.250
73/03/23	10 15		0.555	1.760	0.028	0.038	0.142
73/04/13	10 50		0.550	1.540	0.013	0.044	0.180
73/04/29	14 50		0.240	2.200	0.058	0.140	0.240
73/05/15	14 40		0.380	1.320	0.034	0.154	0.260
73/05/28	10 10		0.600	3.100	0.115	0.220	0.400
73/05/29	09 15		0.084	1.400	0.026	0.200	0.460
73/07/30	15 25		0.010K	2.000	0.023	0.250	0.510
73/08/25	10 10		0.440	2.700	0.230	0.590	0.640

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 74/10/02

5522A4 LS5522A4
43 00 00.0 088 4A 30.0
ROCK RIVER
55 15 FT ATKINSON
1/LAKE KOSHKONONG
ST HWY 89-26 BRDG ABOVE JEFFERSON STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO3&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/23	10 45		0.960	2.550	0.189	0.240	0.394
72/10/22	11 55		0.470	1.615	0.058	0.210	0.300
72/11/26	16 40		1.200	1.720	0.088	0.180	0.240
72/12/16	14 00		2.040	1.800	0.252	0.320	0.410
73/01/23	15 25		2.140	1.890	0.460	0.260	0.360
73/02/11	16 23		1.500	0.160	0.160	0.160	0.220
73/03/18	09 45		1.240	1.390	0.094	0.098	0.197
73/04/06	12 55		0.720	1.600	0.022	0.065	0.170
73/04/26	07 45		0.400		0.170	0.140	0.400
73/05/04	16 55		0.860	2.500	0.076	0.154	0.260
73/05/25	14 10		0.350	1.800	0.096	0.220	0.375
73/06/14	13 04		0.240	3.200	0.105	0.360	0.540
73/07/30			0.110	2.000	0.046	0.280	0.525
73/08/26	12 30		0.240	2.900	0.273	0.357	0.525

STORET RETRIEVAL DATE 74/10/02

552245 LS552245
43 00 30.0 088 49 00.0
ROCK RIVER
55 15 WATERLOO
1/LAKE KOSHKONONG
1ST BRDG ABOV US 18 BROG HELO STP
11F0ALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/23	10 50		0.901	2.150	0.202	0.240	0.290
72/10/22	12 05		0.335	1.540	0.070	0.210	0.300
72/11/25	16 30		1.060	1.540	0.095	0.210	0.260
72/12/16	14 10		2.100	2.700	0.270	0.315	0.400
73/01/23	15 33		1.640	1.600	0.340	0.190	0.260
73/02/11	16 17		1.520	1.600	0.168	0.180	0.230
73/03/18	09 50		1.060	2.200	0.120	0.082	0.170
73/04/06	13 10		0.130	2.800	0.120	0.060	0.180
73/04/26	07 20		0.084	1.680	0.115	0.132	0.240
73/05/04	17 00		0.410	2.000	0.068	0.147	0.230
73/05/25	14 25		0.310	1.800	0.092	0.231	0.370
73/06/16	12 45		0.240	2.500	0.190	0.390	0.510
73/07/30			0.039	2.100	0.058	0.260	0.460
73/08/26	12 27		0.140	2.700	0.510	0.460	0.590

STORET RETRIEVAL DATE 74/10/02

5522A6 LS5522A6
43 04 30.0 088 47 30.0
ROCK RIVER
55 15 WATERLOO
1/LAKE KOSHKONONG
CO HWY B BRDG BELOW JOHNSONCREEK STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/23	11 15		0.873	1.750	0.235	0.260	0.357
72/10/22	12 30		0.336	1.600	0.120	0.190	0.290
72/11/26	16 09		1.100	1.680	0.083	0.170	0.230
72/12/14	14 45		2.140	1.680	0.240	0.240	0.320
73/01/23	15 55		1.540	1.900	0.360	0.200	0.270
73/02/11	16 00		1.520	2.000	0.340	0.170	0.230
73/03/18	10 10		1.040	1.680	0.075	0.075	0.152
73/04/06	13 45		0.091	1.320	0.019	0.048	0.135
73/04/26	07 05		0.073	1.500	0.017	0.126	0.220
73/05/04	17 20		0.340	1.320	0.044	0.147	0.220
73/05/25	14 45		0.290	1.540	0.080	0.240	0.330
73/06/16	12 05		0.231	2.200	0.132	0.390	0.500
73/07/30			0.049	3.150	0.013	0.210	0.400
73/08/26	12 12		0.046	2.700	0.075	0.252	0.460

STORET RETRIEVAL DATE 74/10/02

552247 LS552247
43 05 00.0 088 47 45.0
ROCK RIVER
55 15 WATERLOO
T/LAKE KOSHKONONG
ST HWY 30 BRDG 1 MI NW OF JOHNSON CREEK
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/23	08 05		0.794	1.700	0.169	0.260	0.360
72/10/22	10 45		0.340	1.770	0.240	0.190	0.290
72/11/25	16 00		1.020	1.400	0.110	0.210	0.270
72/12/16	13 00		2.100	1.680	0.380	0.252	0.340
73/01/23	14 30		1.520	1.390	0.340	0.200	0.270
73/02/11	15 50		1.520	1.800	0.160	0.176	0.230
73/03/18	09 02		1.040	3.100	0.105	0.076	0.157
73/04/06	11 40		0.092	1.300	0.025	0.050	0.135
73/04/26	07 33		0.075	1.500	0.033	0.130	0.220
73/05/04	16 15		0.378	1.300	0.180	0.160	0.210
73/05/25	13 05		0.280	1.890	0.092	0.240	0.330
73/06/16	12 30		0.231	2.150	0.210	0.399	0.525
73/07/30	16 20		0.023	2.800	0.011	0.200	0.430
73/08/26	12 00		0.140	2.100	0.390	0.470	0.590

STORET RETRIEVAL DATE 74/10/02

552281 LS552281
42 51 00.0 088 57 00.0
OTTER CREEK
55 15 FT ATKINSON
T/LAKE KOSHKONONG
CO RD XING 1 MI W OF VLG OFKOSHKONONG
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	10	35	0.440	1.300	0.085	0.115	0.190
72/10/20	11	30	1.000	0.700	0.030	0.026	0.050
72/11/30	10	15	1.200	0.710	0.013	0.018	0.032
72/12/27	11	20	1.900	0.580	0.052	0.018	0.036
73/01/29	10	55	1.560	0.810	0.044	0.025	0.055
73/02/26	10	00	1.860	1.150	0.060	0.014	0.040
73/03/23	09	55	0.610	2.600	0.063	0.019	0.020
73/04/13	11	10	0.570	1.700	0.023	0.052	0.180
73/04/29	14	25	0.450	2.600	0.110	0.046	0.085
73/05/15	14	10	0.320	0.740	0.019	0.052	0.085
73/05/28	09	45	0.480	1.000	0.060	0.105	0.160
73/06/29	11	31	0.820	0.880	0.029	0.094	0.150
73/07/30	14	40	1.740	0.720	0.012	0.037	0.100
73/09/25	09	45	2.200	1.150	0.078	0.058	0.090

STORET RETRIEVAL DATE 74/10/02

5522C1 LS5522C1
42 54 00.0 058 59 00.0
KOSHKONONG CREEK
55 15 FT ATKINSON
T/LAKE KOSHKONONG
AT ST HWY 106 BRDG AT BUSSEYVILLE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	10 00		1.690	2.850	0.140	0.231	0.350
72/10/20	11 00		1.400	1.350	0.034	0.190	0.273
72/11/30	09 05		1.370	1.380	0.126	0.176	0.240
72/12/27	10 45		2.300	1.440	0.350	0.240	0.360
73/01/29	10 15		3.500	1.800	0.280	0.225	0.295
73/02/26	09 30		2.800	1.600	0.399	0.220	0.260
73/03/23	09 25		4.800	3.100	0.189	0.129	0.220
73/04/13	09 30		3.900	1.890	0.120	0.110	0.190
73/04/29	14 00		3.200	2.520	0.060	0.147	0.190
73/05/15	13 22		2.600	2.000	0.048	0.150	0.270
73/05/28	09 00		1.880	2.000	0.073	0.189	0.330
73/06/29			2.600	1.540	0.030	0.180	0.375
73/07/30	14 05		2.100	1.600	0.073	0.150	0.300
73/08/25	09 15		2.100	1.390	0.126	0.220	0.390

STORET RETRIEVAL DATE 74/10/02

5522C2 LS5522C2
42 57 00.0 089 01 30.0
KOSHKONONG CREEK
55 15 STOUGHTON
T/LAKE KOSHKONONG
CO HWY C 2 MI S OF ROCKDALE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	09 40		1.870	2.850	0.152	0.210	0.336
72/10/20	10 45		1.760	0.950	0.042	0.231	0.320
72/12/27	10 35		2.600	1.680	0.470	0.294	0.370
73/01/29	10 00		3.800	2.600	0.350	0.245	0.330
73/02/26	09 10		2.700	1.300	0.570	0.280	0.330
73/03/23	09 10		5.100	2.600	0.220	0.123	0.235
73/04/13	09 15		5.200	2.300	0.132	0.105	0.185
73/04/29	13 55		4.100	2.820	0.120	0.160	0.290
73/05/15	13 10		2.800	2.100	0.077	0.168	0.300
73/05/28	08 36		1.820	2.100	0.091	0.180	0.345
73/06/29	10 20		2.200	1.100	0.030	0.210	0.345
73/07/30	13 50		1.820	0.880	0.066	0.260	0.370
73/09/25	08 50		1.900	2.300	0.126	0.280	0.490

STORET RETRIEVAL DATE 74/10/02

S522C3 LS5522C3
42 49 00.0 089 01 00.0
KOSHKONONG CREEK
55 15 STOUGHTON
T/LAKE KOSHKONONG
DANE CO HWY B UPPER END ROCKDALE MILL PD
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	09 35		1.640	3.000	0.110	0.220	0.340
72/10/20	10 35		1.700	0.850	0.057	0.260	0.340
72/11/30	09 10		1.150	1.500	0.071	0.200	0.290
72/12/27	10 20		2.400	1.900	0.470	0.320	0.410
73/01/29	09 45		3.700	1.000	0.440	0.215	0.315
73/02/25	09 00		2.200	1.800	0.470	0.200	0.290
73/03/23	09 00		5.000	3.500	0.270	0.140	0.245
73/04/13	09 05		6.300	2.730	0.140	0.092	0.210
73/04/24	13 45		3.200	3.300	0.154	0.147	0.240
73/05/15	13 00		2.900	1.940	0.056	0.150	0.250
73/05/28	08 30		2.200	2.400	0.058	0.168	0.390
73/06/29	10 05		2.500	1.500	0.051	0.231	0.470
73/07/30	13 40		2.300		0.007	0.310	
73/08/25	08 40		1.740	2.300	0.110	0.335	0.490

STORET RETRIEVAL DATE 74/10/02

5522C4 LS5522C4
43 01 30.0 089 00 30.0
KOSHKONONG
55 15 SUN PRAIRIE
T/LAKE KOSHKONONG
JEFFERSON CO RD XING ABV CAMBRIDG STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	09	35	8.075	3.450	0.120	0.240	0.410
72/10/20	12	00	1.700	0.800	0.079	0.336	0.440
72/11/30	09	00	1.300	1.760	0.415	0.240	0.310
72/12/27	10	10	2.600	2.800	0.695	0.350	0.440
73/01/29	09	30	4.600	2.800	0.580	0.271	0.380
73/02/26	08	45	3.000	2.100	0.930	0.450	0.530
73/03/23	08	45	5.600	2.800	0.270	0.160	0.210
73/04/14	08	45	7.400	3.000	0.176	0.105	0.230
73/04/29	13	40	3.800	2.730	0.180	0.198	0.285
73/05/15	12	45	3.300	2.200	0.115	0.180	0.313
73/05/28	08	15	2.800	2.800	0.085	0.176	0.390
73/06/29	09	54	2.700	1.380	0.042	0.330	0.450
73/07/30	13	30	2.500	1.680	0.040	0.300	0.430
73/08/25	08	25	2.100	1.540	0.105	0.460	0.690

STORET RETRIEVAL DATE 74/10/02

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 552201          LS552201
42 55 30.0 088 49 30.0
BARK RIVER
55       15 FT ATKINSON
T/LAKE KOSHKONONG
BRDG IN BARK RIVER PARK                                        88
11EPALES                    2111204
4                           0000 FEET  DEPTH
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DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/24	10 55		0.350	2.150	0.227	0.171	0.220
72/10/20	12 45		0.810	1.400	0.092	0.180	0.230
72/11/30	11 00		1.540	1.400	0.110	0.110	0.154
72/12/27	12 25		1.620	1.400	0.250	0.100	0.140
73/01/29			1.500	1.200	0.120	0.091	0.120
73/02/26	10 45		1.320	0.960	0.290	0.147	0.155
73/03/23	10 30		1.340	3.180	0.110	0.063	0.135
73/04/13	10 45		1.200	1.050	0.020	0.077	0.145
73/04/29	14 40		0.760	2.100	0.050	0.120	0.185
73/05/15	14 30		0.910	1.700	0.030	0.140	0.230
73/05/28	10 00		0.430	1.600	0.110	0.200	0.280
73/06/29	09 00		0.600	2.000	0.230	0.280	0.460
73/07/30	15 30		0.670	1.320	0.016	0.160	0.280
73/08/25	10 00		0.720	1.470	0.089	0.250	0.340

STORET RETRIEVAL DATE 74/10/02

5522E1 L55522E1
43 04 00.0 088 46 30.0
JOHNSON CREEK
55 15 WATERLOO
T/LAKE KOSHKONONG
CO HWY Y XING ABV JOHNSON CREEK STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/23	11	00	0.240	2.050	0.172	0.122	0.170
72/10/22	11	16	1.160	2.800	0.240	0.115	0.240
72/11/26	16	15	1.020	1.800	0.022	0.011	0.049
72/12/16	14	40	1.160	1.600	0.199	0.014	0.060
73/01/23	13	45	1.660	1.470	0.110	0.037	0.080
73/02/11	16	10	1.600	2.700	0.105	0.026	0.060
73/03/18	10	03	1.360	3.200	0.240	0.024	0.145
73/04/06	13	30	0.830	2.730	0.092	0.019	0.080
73/04/26	07	10	0.336	3.150	0.105	0.034	0.100
73/05/04	17	15	0.860	3.150	0.065	0.038	0.110
73/05/25	14	40	0.357	2.900	0.072	0.105	0.210
73/06/16	12	15	0.770	2.800	0.180	0.126	0.315
73/07/30			0.390	2.000	0.005K	0.046	0.200
73/09/26	12	15	0.460	1.470	0.220	0.084	0.270

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 74/10/02

5522F1 LS5522F1
43 00 30.0 088 49 45.0
CRAWFISH RIVER
55 15 WATERLOO
T/LAKE KOSHKONONG
US 18 BRDG BELO LAKE MILLS STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/23	10 30		0.400	1.900	0.132	0.320	0.410
72/10/22	11 40		0.900	1.700	0.220	0.240	0.345
72/11/26	16 45		1.640	1.500	0.044	0.110	0.180
72/12/16	14 30		2.600	1.600	0.240	0.200	0.280
73/01/23	13 15		2.700	2.400	0.510	0.310	0.440
73/02/11	16 32		1.440	2.000	0.147	0.140	0.210
73/03/18	09 40		1.560	2.500	0.138	0.132	0.210
73/04/06	12 45		1.600	2.310	0.021	0.075	0.175
73/04/26	07 48		0.750	1.900	0.035	0.147	0.270
73/05/04	16 50		1.220	1.640	0.036	0.168	0.280
73/05/25	14 00		0.670	3.000	0.063	0.210	0.320
73/06/16	13 09		0.200	1.760	0.198	0.294	0.530
73/07/30			0.038	2.600	0.005K	0.189	0.470
73/09/26	12 40		0.290	1.980	0.030	0.231	0.440

K VALUE KNOWN TO BE LESS
THAN INDICATED

STORET RETRIEVAL DATE 74/09/30

552250 AS552250 009164
42 55 30.0 088 51 30.0
CITY OF FORT ATKINSON
55 15 WATERLOO
T/LAKE KOSHKONONG
ROCK RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/01/18	08 00								
CP(T)-			0.050	24.000	5.950	4.900	5.770	1.640	1.400
73/01/18	16 00								
73/02/05	08 00								
CP(T)-			0.590	19.900	5.000	5.880	8.600	1.960	1.670
73/02/05	16 00								
73/03/02	08 00								
CP(T)-			0.055	22.000	6.100	5.300	6.700	1.710	1.640
73/03/02	16 00								
73/04/02	08 00								
CP(T)-			0.420	23.000	6.100	3.000	4.400	2.470	2.630
73/04/02	16 00								
73/05/02	07 00								
CP(T)-			0.927	10.500	0.030	1.680	2.700	3.170	2.620
73/05/02	16 00								
73/06/04	08 00								
CP(T)-			1.290	13.800	0.845	3.140	3.600	2.960	2.620
73/06/04	16 00								
73/07/05	08 00								
CP(T)-			7.100	5.500	0.495	10.000	11.000	1.890	2.310
73/07/05	16 00								
73/08/06	08 00								
CP(T)-			2.600	21.000	5.300	5.300	6.400	1.890	1.650
73/08/06	16 00								
73/09/06	08 00								
CP(T)-			0.860	21.200		5.800		1.610	1.580
73/09/06	16 00								
73/10/09	08 00								
CP(T)-			0.190	12.500	1.900	5.000	6.800	1.680	1.100
73/10/09	16 00								
73/11/01	08 00								
CP(T)-			1.800	22.000	5.250	4.900	7.400	1.610	1.570
73/11/01	16 00								
73/12/03	08 00								
CP(T)-			0.270	29.000	8.100	6.600	11.000	1.980	1.360
73/12/03	16 00								

STORET RETRIEVAL DATE 74/11/16

[illegible] 45552250 POTOMAC
42 33 40.0 077 51 30.0
CITY OF FORT [illegible]
15 [illegible]
[illegible]
[illegible]
[illegible] 2141204
[illegible] 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO3&NO2 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	[illegible] [illegible] MG/L [illegible]	50051 FLOW RATE [illegible]	50053 CONDUIT FLOW-MGD AQUIMET
74/01/15	09 00								
01(T)-			1.003	25.000	4.200	6.700	15.500	1.32[illegible]	1.430
74/01/1[illegible]	16 [illegible]								

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STORET RETRIEVAL DATE 74/04/30

552251 TF552251 P005429
43 00 00.0 088 48 30.0
CITY OF JEFFERSON
55 15 WATERLOO
T/LAKE KOSHKONONG
ROCK RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50050 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/01/04	05	00							
CP(T)-			4.840	5.300	0.144	4.437		1.680	1.200
73/01/05	05	00							
73/02/06	04	00							
CP(T)-			6.500	4.700	0.185	7.500	7.800	1.400	1.200
73/02/07	04	00							
73/03/09	05	00							
CP(T)-			4.200	3.800	0.270	4.000	4.100	2.420	1.200
73/03/10	05	00							
73/04/12	05	00							
CP(T)-			4.000	2.400	0.360	6.100	7.600	1.830	1.700
73/04/13	05	00							
73/05/10	05	00							
CP(T)-			5.600	5.400	0.068	2.400	3.600	2.710	2.500
73/05/11	05	00							
73/06/26	05	00							
CP(T)-			1.240	2.500	0.820	6.100	7.000	1.290	1.450
73/06/27	05	00							
73/07/17	05	00							
CP(T)-			7.000	2.400	0.120	5.300	6.200	1.220	1.200
73/07/18	05	00							
73/08/08	05	00							
CP(T)-			4.800	3.400	0.170	3.800	4.700	1.260	1.200
73/08/09	05	00							
73/09/11	05	00							
CP(T)-			9.000	2.600	0.073	7.500	8.150	1.020	1.100
73/09/12	05	00							
73/10/10	05	00							
CP(T)-			9.400	2.500	0.100	10.000	12.500	1.470	1.200
73/10/11	05	00							
73/11/06	12	00							
CP(T)-			4.400	2.400	0.170	6.100	7.100	1.160	1.200
73/11/07	12	00							
73/12/05	05	00							
CP(T)-			7.000	4.000	0.370	5.400	7.000	1.700	1.200
73/12/06	05	00							

STORET RETRIEVAL DATE 74/09/30

552251 TF552251 P005429
43 00 00.0 088 48 30.0
CITY OF JEFFERSON
55 15 WATERLOO
T/LAKE KOSHKONONG
ROCK RIVER
11EPALES 2141204
4 0000 FEET DE

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/01/04	05 00								
CP(T)-			3.400	3.400	0.110	10.600	11.000	1.230	1.300
74/01/25	15 05								

STORET RETRIEVAL DATE 74/04/30

552253 02552253 P0006F9
+3 30 00.0 084 01 30.0
VLG OF CAMBRIDGE
25 15 STONEMILL
FLASH ROSHKOMONG
ROSHKOMONG CREEK
11FWALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO3+NO2 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST CFS	50053 CONDUIT FLOW-MGD MONTHLY
73/02/07	10 30		0.050	8.700	0.840	4.400	5.100	0.047	0.094
73/02/28	14 30		0.040	11.500	2.300	5.000	5.400	0.094	0.096
73/04/04	14 30		0.045	13.600	0.435	4.700	5.550	0.140	0.120
73/04/30	10 00		0.810	8.200	0.395	3.400	3.600	0.150	0.135
73/05/29	10 00		0.052	4.450	1.050	4.400	4.850	0.245	0.160
73/07/12	11 00		0.150	4.900	0.078		5.400	0.089	0.096
73/07/27	14 00							0.083	0.087
73/08/27	14 30		0.040	1.500	0.056	2.060	2.200	0.040	0.095
73/10/09	14 00		0.037	3.600	0.120	5.600	5.625	0.081	0.085
73/11/23	11 00		0.220	6.400	0.410	4.420	6.000	0.040	0.093
74/02/18	14 30		0.200	12.000	4.200	5.500	6.400	0.037	0.089

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